

ALLOY DATA SHEET



G25CrMo4

Visit our website
www.safe-metal.com



WHO ARE WE ?

Safe Metal is the world leader in steel components made by green sand casting. Our teams operate as part of an international network that stretches across Europe, America and Asia, and partner their sales and project management skills with those of their customers.

MAKING WORLD CLASS

Thanks to the expert skills of our R&D department, we are able to improve our industry knowledge and hence our products, our production process and metalworking by choosing the most appropriate methods for the product



G25CrMo4

Generality

Medium carbon steel chromium-molybdenum for high mechanical characteristics at treated condition. Good hardenability and medium weldability.

Market : this alloy can be used in all markets.



Chemical Composition

| C (%) | Si (%) | Mn (%) | P (%) | S (%) | Cr (%) | Mo (%) |
|-------------|--------|-----------|---------|--------|-----------|------------|
| 0,22 – 0,29 | < 0,6 | 0,5 – 0,8 | < 0,025 | < 0,02 | 0,8 – 1,2 | 0,15 – 0,3 |

Main characteristics

G25CrMo4

Family : High resistance

Weldability



Machining



Impact test values



Cost



Mechanical resistance



G25CrMo4

Mechanical characteristics & Heat treatment

| Reference | Designation | | Heat Treatment | | | Thickness t mm | Mechanical properties | | | | |
|--|-------------|--------|----------------|--|-----------------------------|----------------------|----------------------------------|----------------------------|------------|--------------|----------|
| | Name | Number | Symbol | Normalizing or austenitizing °C | Tempering °C | | Tensile test at room temperature | | | Impact test | |
| | | | | | | | R _{p0.2} MPa min. | R _m Mpa min. | A% min. | KV J min. | Temp. °C |
| Safe Metal possibilities according to norms : | | | | | | | | | | | |
| EN 10298:2015 | G26CrMo4 | 1.7221 | +QT1 | 880 to 950 | 600 to 650 | t ≤ 100 | 450 | 600 to 750 | 16 | 40 | RT |
| | | | +QT2 | 880 to 950 | 550 to 600 | t ≤ 100 | 550 | 700 to 850 | 10 | 18 | RT |
| SEW 685 | G26CrMo4 | 1.7221 | +QT | 880 to 930 | 650 to 700 | t ≤ 100 | 340 | 550 to 700 | 16 | 27 | -50 |
| Safe Metal other possibilities : | | | | | | | | | | | |
| Safe Metal | G25CrMo4 | | +N | | | t ≤ 30 | 350 | 660 | 11 | 12 | -20 |
| Safe Metal | G25CrMo4 | | +QT HR | | High R _m | t ≤ 30 | 700-800 | 850-950 | 10 | 22 | -20 |
| Safe Metal | G25CrMo4 | | +QT M | | Balanced R _m /Kv | t ≤ 30 | 600-700 | 750-850 | 14 | 58 | -20 |
| Safe Metal | G25CrMo4 | | +QT HD | | High Kv | t ≤ 30 | 500-600 | 650-750 | 20 | 78 | -20 |

RT : Room temperature

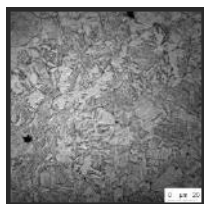
HR : High resistance N : Normalized

QT : Liquid quenched and tempered

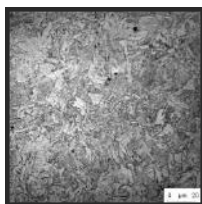
HD : High ductility

Microstructures

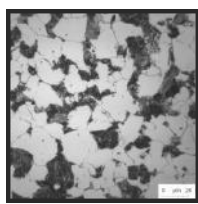
QUENCHING + TEMPERED AT 500 °C



QUENCHING + TEMPERED AT 600 °C



NORMALIZED



Machining

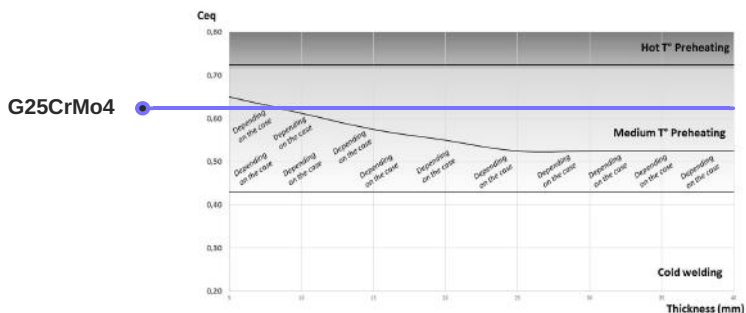
| | | | HB mini * | Microstructure |
|---------------|----------|--------|-----------|------------------------------|
| EN 10293:2015 | G26CrMo4 | +QT1 | 180-230 | Tempered Martensite |
| EN 10293:2015 | G26CrMo4 | +QT2 | 210-260 | Tempered Martensite |
| SEW 685 | G26CrMo4 | +QT | 160-210 | Tempered Martensite |
| Safe Metal | G25CrMo4 | +N | 194 | Ferrite + Pearlite + Bainite |
| Safe Metal | G25CrMo4 | +QT HR | 280 | Tempered Martensite |
| Safe Metal | G25CrMo4 | +QT M | 220 | Tempered Martensite |
| Safe Metal | G25CrMo4 | +QT HD | 175 | Tempered Martensite |

* HB : Brinell hardness

G25CrMo4

Welding

Preheating conditions according to thickness and equivalent carbon. A specific zone is defined where preheating is not absolutely necessary and depends on the case.



Welding comparative table

| Grade | Group (ISO TR 15608) | Filler Metal | Post-Welding HT | Hardness of melted area (HV10) | Rm (MPa) | Process (acc. NFEN ISO 15614) |
|----------------|----------------------|--------------|-----------------|--------------------------------|----------|-------------------------------|
| C steel | | | | | | |
| C25 | 1.2 | E71T5 | SR/N | 130-170 | 450-550 | 111/135 |
| | | E71T5 | QT | 150-200 | 500-600 | |
| G20Mn5 | 1.2 | E70C6 M H4 | SR/N | 150-200 | 500-600 | |
| | | E70C6 M H4 | QT | 160-220 | 540-580 | |
| G24Mn6 | 3.1 | ER110T5 | SR | 240-300 | 750-900 | |
| | | ER110T5 | QT | 260-340 | 780-950 | |
| G28Mn6 | 3.1 | ER90S02 | SR | | | |
| | | ER90S02 | SR | | | |
| QE230 | 1.1 | E71T5 | SR/N | 130-170 | 450-550 | |
| | | E71T5 | QT | 150-200 | 550-650 | |
| QE260 | 1.2 | E70C6 M H4 | SR/N | 150-200 | 500-550 | |
| | | E70C6 M H4 | QT | 160-220 | 540-580 | |
| G20MnV5 | 3.1 | ER110T5 | SR | 240-300 | 750-900 | |
| | | ER110T5 | QT | 260-340 | 780-950 | |
| Cr-Mn | | | | | | |
| G18CrMo4 | 5.1 | E9018B3 | SR | 180-250 | 620-680 | 111/135 |
| G25CrMo4 | 5.1 | E9018B3 | QT | 200-260 | 630-720 | 111/135 |
| G30CrMo4 | 5.1 | E12018G | QT | 300-350 | 950-1150 | 111 |
| G21CrMoV5-11 | 6.2 | E13018G | SR | 280-350 | 800-1000 | 111 |
| Others | | | | | | |
| G10NiMoV5 | 3.1 | ER80 S-G | SR | 200-280 | 620-660 | 135 |
| | | ER80 S-G | QT | 160-220 | 580-640 | |
| G20NiCrMo4 | 4.2 | ER120 S-G | SR | 300-350 | 900-960 | |
| | | ER120 S-G | QT | 280-350 | 920-1020 | |

111 : Electrode welding
135 : MAG

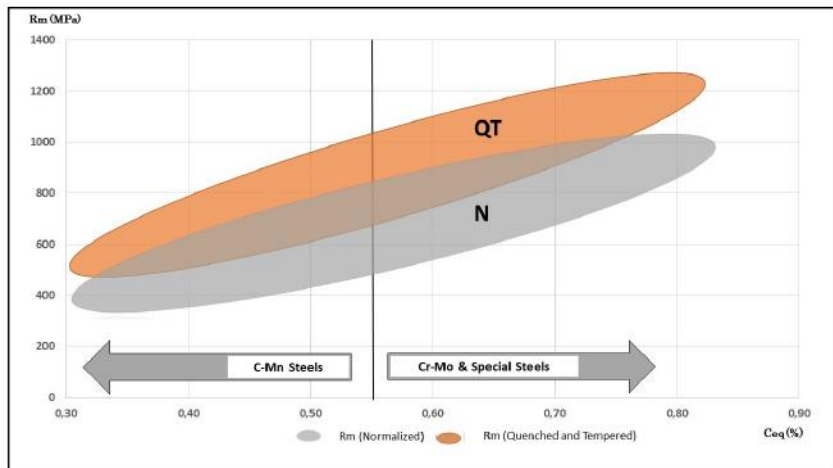
SR : Stress relieving
QT : Quenched and Tempered

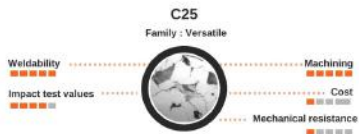
N : Normalized

G25CrMo4

Comparative Table of Safe Metal grades

| Chemical composition | | | | | | | | | N | | | QT (Q220°C) | | |
|----------------------|-------|--------|--------|--------|--------|-------|--------|---------|-----|----|------------|-------------|---------|------------|
| C-Mn | C (%) | Mn (%) | Si (%) | Cr (%) | Mo (%) | V (%) | Ni (%) | Coq (%) | Rm | AK | Kv (-20°C) | Rm | AK | Kv (-20°C) |
| C25 | 0,2 | 0,7 | 0,45 | | | | | 0,32 | 440 | 25 | 22 | 420-530 | 20-25 | 40-50 |
| GE20 | 0,23 | 0,9 | 0,5 | | | | | 0,4 | 480 | 25 | 12 | 520-605 | 25-30 | 65-20 |
| GE20 | 0,24 | 1,2 | 0,5 | 0,15 | | | | 0,47 | 530 | 20 | 10 | 600-800 | 15-23 | 20-40 |
| G20Mn5 (low) | 0,2 | 1,1 | 0,4 | | | | | 0,38 | 470 | 28 | 40 | 500-590 | 20-22 | 38-46 |
| G20Mn5 (high) | 0,23 | 1,4 | 0,5 | | | | | 0,5 | | | | 600-880 | 46-25 | 25-30 |
| G20MnV6 | 0,23 | 1,55 | 0,5 | | | 0,05 | | 0,54 | 580 | 25 | 10 | | | |
| G24Mn6 (low) | 0,23 | 1,65 | 0,5 | | | | | 0,52 | 590 | 18 | 10 | 550-670 | 20-25 | 40-75 |
| G24Mn6 (high) | 0,25 | 1,8 | 0,5 | | | | | 0,6 | 630 | 32 | 10 | 620-900 | 6-1-25 | 15-35 |
| G28Mn6 | 0,3 | 1,4 | 0,5 | | | | | 0,53 | 650 | 17 | 10 | 650-840 | 6-1-13 | 30-60 |
| G30MnV6 | 0,3 | 1,4 | 0,5 | | | | | 0,55 | 650 | 12 | 30 | 700-950 | 6B-d6c | 30-45 |
| Chemical composition | | | | | | | | | N | | | QT (Q220°C) | | |
| Cr-Mo | C (%) | Mn (%) | Si (%) | Cr (%) | Mo (%) | V (%) | Ni (%) | Coq (%) | Rm | AK | Kv (-20°C) | Rm | AK | Kv (-20°C) |
| G18CrMo4 | 0,18 | 0,8 | 0,4 | 1 | 0,2 | | | 0,55 | 450 | 18 | 10 | 560-720 | 6B-c-22 | 30-80 |
| G25CrMo4 | 0,25 | 0,8 | 0,4 | 1 | 0,2 | | | 0,62 | 660 | 11 | 12 | 600-950 | 6-1-18 | 20-90 |
| G30CrMo4 | 0,3 | 0,8 | 0,4 | 1 | 0,2 | | | 0,67 | 840 | 5 | 10 | 650-1050 | 6-1-18 | 20-90 |
| G21CrMoV5-11 | 0,2 | 0,7 | 0,5 | 1,15 | 1 | 0,3 | | 0,82 | 980 | 5 | 5 | 900-1200 | 05-6-1 | 5 |
| Chemical composition | | | | | | | | | N | | | QT (Q220°C) | | |
| Others | C (%) | Mn (%) | Si (%) | Cr (%) | Mo (%) | V (%) | Ni (%) | Coq (%) | Rm | AK | Kv (-20°C) | Rm | AK | Kv (-20°C) |
| G10MnNiV6 | 0,12 | 1,35 | 0,5 | | | 0,08 | | 0,42 | 460 | 17 | 10 | 580-750 | 14-16 | 20-50 |
| G20MnCr4 | 0,18 | 1 | 0,4 | 0,4 | 0,6 | | 0,9 | 0,62 | 750 | 5 | 10 | 600-950 | 6B-c-20 | 35-100 |







Learn more about us on our website :

»»»»»»»»»» www.safe-metal.com ««««««««««



Or contact us :



+ (33) 4 69 84 23 96



contact@safe-metal.com



+ (33) 4 69 84 23 99



2 Place de Francfort
69003 Lyon - France